



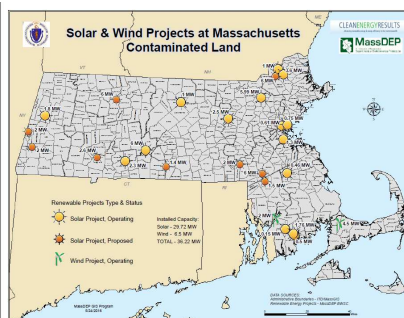
## Contaminated Land/Brownfield PV

(as of 5/12/16)

### ~~25~~ 26 Total Projects (~~59~~ 65 MWs)

- 17 projects (36 MW) are now operating. (yellow)

- ~~8~~ 9 projects (~~23~~ 29MWs) have DOER “Brownfield Pre-Determination” letters and are seeking financing and interconnection permits (orange)



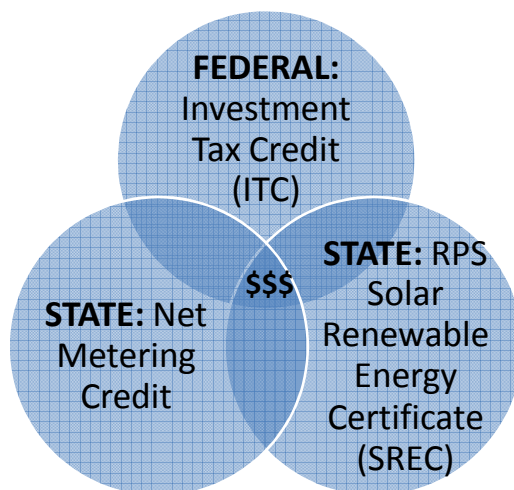
<http://www.mass.gov/eea/agencies/ma-sdep/climate-energy/energy/contaminated-land-and-brownfields/>

05/26/16

3



## SOLAR PV INCENTIVES



05/26/16

4



## Investment Tax Credit (ITC)

### Issue

- 30% tax liability credit
- Set to Expire December 31, 2016
- Will default to 10%

### Resolution

- December 2015 Congressional spending bill included an extension of the ITC for solar photovoltaic's.
- Now active through December 31, 2019, after which the credit will be stepped down to 26% and 22% in 2020 and 2021, respectively.

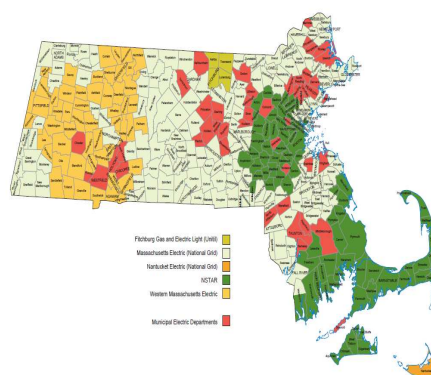
05/26/16

5



## Net Metering Credits

- Customers are compensated for any electricity they generate and don't use
- Customer receives credit on bill for net excess generation
- Credits for wind and solar are close to the retail rate
- Customer can allocate credits to different accounts (yours or other customers)
- Thus, generation in one location can offset electricity costs in another location (a.k.a. virtual net metering)



05/26/16

6



## Net Metering Credits

### Issue

#### Statutory :

- 4% cap on “private” projects
- 5% cap on “public” projects
- Caps are based on the distribution company’s peak demand
- Small net metering systems are exempt from the net metering caps (e.g. Residential ≤25 kW DC)

### Resolution

- April 11, 2016 Solar Legislation signed: “An Act Relative to Solar Generation”
  - 7% cap on “private” projects
  - 8% cap on “public” projects
- New “Market Net Metering Credit” for all projects (except residential, small commercial, municipal and government owned) to 60% of the full retail value
- Allows distribution companies to propose to DPU a monthly “Minimum Reliability Contribution” for eclectic distribution utility accounts receiving Net metering Credits. (Possible exemptions include low income, and for 4 years post 12/31/16 service)
- 220 CMR 18.00 Net Metering Emergency Regulations

05/26/16

7



Date: 3/3/2016							
Private and Public, All Utilities (Values in kW-AC)							
		Capacity (kW)					
	Net Metering Cap	999,942					
	Interconnected	601,218					
	Reserved Cap Allocations	235,765					
	Pending Cap Allocations	32,351					
	Capacity Available under the Cap	130,608					
Private: Available, Interconnected, Reserved and Pending Capacity (Values in kW)							
Company	Net Metering Cap	Interconnected (a)	Reserved Cap Allocations (b)	Pending Cap Allocations (c)	Capacity Available Under Cap (e)	Waiting List (d)	
NGrid	205,240	129,193	73,679	1,153	1,215	121,689	
NStar	199,120	98,632	54,470	14,497	31,521	0	
WMECO	34,160	14,208	3,780	3,502	12,671	0	
Unitil	4,080	3,325	745	0	10	369	
NGrid-Nantucket	1,819	0	24	29	1,765	0	
Total	444,419	245,358	132,698	19,180	47,183	122,059	
Public: Available, Interconnected, Reserved and Pending Capacity (Values in kW)							
Company	Net Metering Cap	Interconnected (a)	Reserved Cap Allocations (b)	Pending Cap Allocations (c)	Capacity Available Under Cap (e)	Waiting List (d)	
NGrid	256,550	205,386	47,974	3,119	71	65,686	
NStar	248,900	127,871	41,347	8,352	71,330	0	
WMECO	42,700	19,456	13,746	1,700	7,797	0	
Unitil	5,100	3,047	0	0	2,053	0	
NGrid-Nantucket	2,274	100	0	0	2,174	0	
Total	555,524	355,860	103,067	13,171	83,426	65,686	

05/26/16


8



Date: 5/24/2016							
Private and Public, All Utilities (Values in kW-AC)							
		Capacity (kW)					
	Net Metering Cap	1,666,571					
	Interconnected	624,244					
	Reserved Cap Allocations	468,731					
	Pending Cap Allocations	4,869					
	Capacity Available under the Cap	568,727					
<div style="float: right; text-align: right;"> <b>May 2016</b>  <b>Net metering</b>  <b>Queue</b> </div>							
Private: Available, Interconnected, Reserved and Pending Capacity (Values in kW)							
Company	Net Metering Cap	Interconnected (a)	Reserved Cap Allocations (b)	Pending Cap Allocations (c)	Capacity Available Under Cap (e)	Waiting List (d)	
<a href="#">NGrid</a>	359,170	134,605	198,681	7	25,877	31,936	
<a href="#">NStar</a>	348,460	104,680	78,664	76	165,041	5,592	
<a href="#">WMECO</a>	59,780	15,141	15,211	42	29,386	5,957	
<a href="#">Unitil</a>	7,140	3,369	1,129	0	2,642	0	
<a href="#">NGrid-Nantucket</a>	3,183	0	60	0	3,123	0	
<b>Total</b>	<b>777,733</b>	<b>257,795</b>	<b>293,744</b>	<b>124</b>	<b>226,069</b>	<b>43,484</b>	
Public: Available, Interconnected, Reserved and Pending Capacity (Values in kW)							
Company	Net Metering Cap	Interconnected (a)	Reserved Cap Allocations (b)	Pending Cap Allocations (c)	Capacity Available Under Cap (e)	Waiting List (d)	
<a href="#">NGrid</a>	410,480	210,875	106,675	3,119	89,811	16,658	
<a href="#">NStar</a>	398,240	132,971	50,813	1,479	212,977	0	
<a href="#">WMECO</a>	68,320	19,456	15,446	147	33,270	0	
<a href="#">Unitil</a>	8,160	3,047	2,053	0	3,061	0	
<a href="#">NGrid-Nantucket</a>	3,638	100	0	0	3,538	0	
<b>Total</b>	<b>888,838</b>	<b>366,449</b>	<b>174,987</b>	<b>4,745</b>	<b>342,658</b>	<b>16,658</b>	

05/26/16

9



05/26/16

9

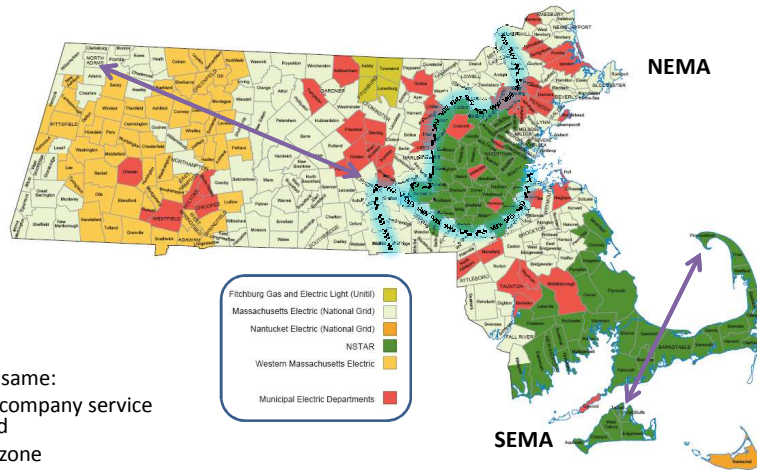


## Net Metering Credits

May 2016: Cap space still available for government projects in National Grid territory and private and government projects in other utility territories.

WCMA

NEMA



SEMA

Allocation only in same:

- (1) Distribution company service territory; and
- (2) ISO-NE load zone

05/26/16

Slide 10



## RPS Solar Carve-out Renewable Energy Certificates (SREC) (225 CMR 14.00)

### Issue

- Program cap of **1600 MW**
- Financial incentives differentiated between Market Sectors
- Favorability to Landfill and Brownfield type projects
- **1,200 MW additional Cap met on February 5, 2016. (660.595 + 854 MW applications = 1,514.5)**
- **120 MW reserved for projects equal to or less than 25kW DC (residential)**

### Resolution

- April 8, 2016 DOER filed emergency regulation 225 CMR 14.00
- Residential projects eligible until start of “new” program.
- Projects  $\geq$  25kW authorized to interconnect or constructed within 9 months of effective date - **by January 8<sup>th</sup> 2017**
- Development of SREC III!

05/26/16

11



## Greener Cleanup Leadership Recognition Program



## SUBMISSION FOR SELECTION

- **DUE: June 30<sup>th</sup> 2016**
- Self-identifying Application Process:
  - Submission: Email  
[Thomas.Potter@state.ma.us](mailto:Thomas.Potter@state.ma.us)  
 and/or  
[Susan.Fessenden@state.ma.us](mailto:Susan.Fessenden@state.ma.us)
  - Include: Release Tracking Number (RTN), submittal type/name, submittal date



05/26/16

13



## Greener Cleanups Updates

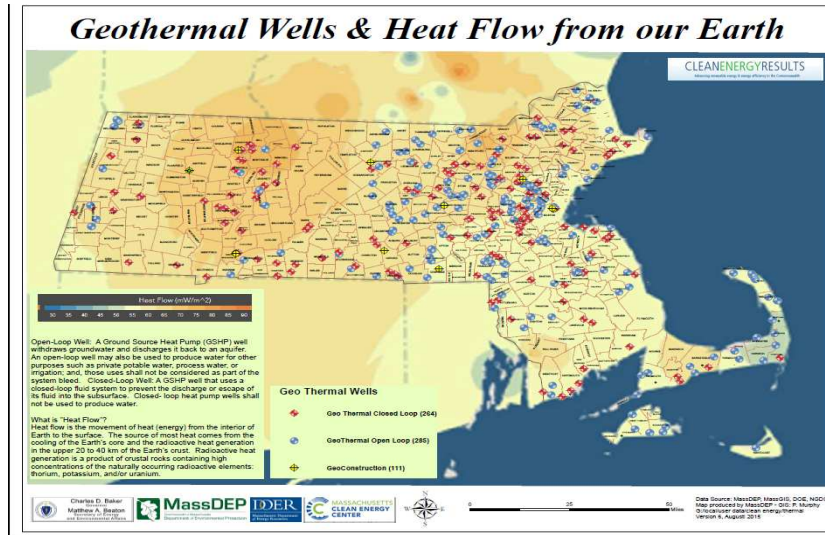
- **REVISED ASTM Standard Guide (E2893-16)**
  - ~~April 1, 2016~~ **May 12, 2016**
  - Adjunct BMP Table
  - **60-day Free Trial begins Fall 2016**

05/26/16

14



## RENEWABLE THERMAL – Ground-Source Heat Pumps



05/26/16

15



### OPPORTUNITY:

#### Commonwealth Accelerated Renewable Thermal Strategy (CARTS)

- **January 2014 Study**
- **Market:**
  - Commercial, Large Buildings, Using Fuel Oil / Electricity
  - Residential, High Income, Using Fuel Oil
  - Residential, Low Income, Using Fuel Oil / Electric
  - “Priority customers will likely be living in areas not served by natural gas utilities, outside of gas service areas, or a long distance from gas distribution. Currently about 1.2 million households in Massachusetts are not using natural gas for space heating”

NAVIGANT

MEISTER

#### Commonwealth Accelerated Renewable Thermal Strategy

Final Report

Prepared for:

Massachusetts Department of Energy Resources



NAVIGANT CONSULTING, INC.  
77 South Bedford Street  
Boston, MA 02109

TEL: 617-511-0100

www.navigant.com

January 2014



This document is confidential and proprietary to its author(s). It may be revised and distributed solely for the purpose of consultation.

©2014 Navigant Consulting, Inc.

05/26/16

16





## Why Licensed Site Professionals?

LSP's have the professional credentials that align with GSHP applications

- Geologists
- Hydrogeologists
- Engineers
- Environmental Scientists

MCP Considerations for Ground-Source Heat Pump Applications to:

- Site Redevelopment
- Remedial Response
- Remedy Repurposing



**May 2015 Training for LSP!**

05/26/16

17



## Guidelines For Ground Source Heat Pump Wells

- MassDEP Bureau of Water Resources (BWR) **regulates GSHP installations (open/closed loop)**
- BWSC working with BWR on contaminated site applications



Commonwealth of Massachusetts  
Department of Environmental Protection  
Bureau of Resource Protection  
Drinking Water Program

Guidelines For  
Ground Source Heat Pump Wells

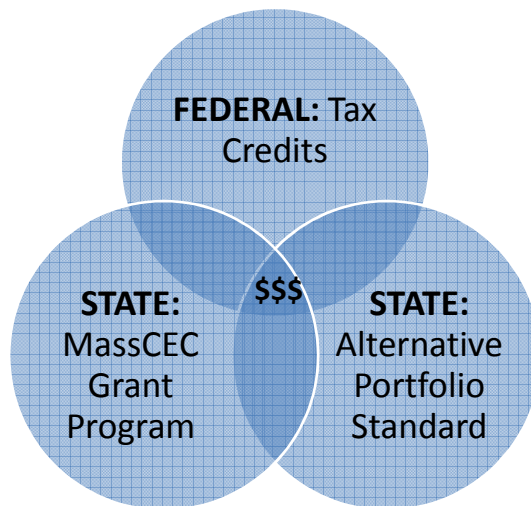
Underground Injection Control Program  
January 2012

05/26/16

18



## GSHP Incentives (“Geothermal”)



05/26/16

19



## Tax Credits: Residential Renewable Energy Tax Credit & Investment Tax Credit (ITC)

### Issue

- 30% Residential Renewable Energy Tax Credit
- 10% Investment Tax Credit – Commercial
- Residential set to Expire December 31, 2016

### Resolution

- December 2015 Congressional spending bill **DID NOT** include an extension of the Residential Tax Credit
- Ongoing congressional activity to include tax credit in future.

05/26/16

20



## Alternative Portfolio Standard (225 CMR 16.00)

### Issue

- Ground-Source Heat Pumps not included and not incentivized.

### Resolution

- August 2014 Statutory changes
- Draft Regulations December 2014.
- May 24, 2016 “new” regulatory package.
  - Incentives like SREC

05/26/16

21



## MassCEC Clean Heating & Cooling Grant Program

### Issue

- Initial November 2014 program did not include commercial projects

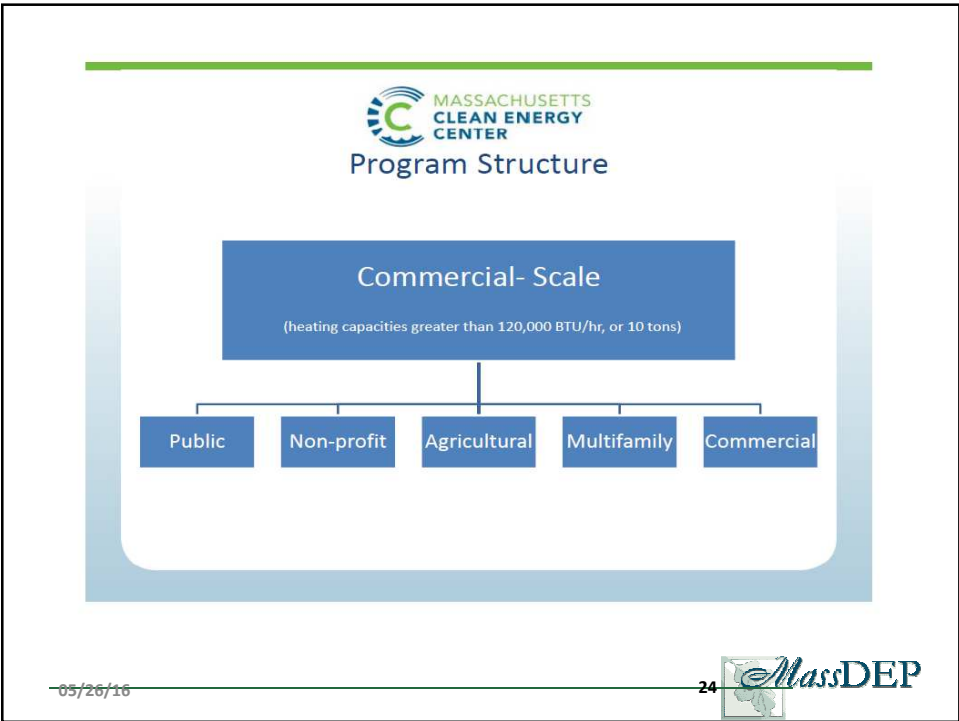
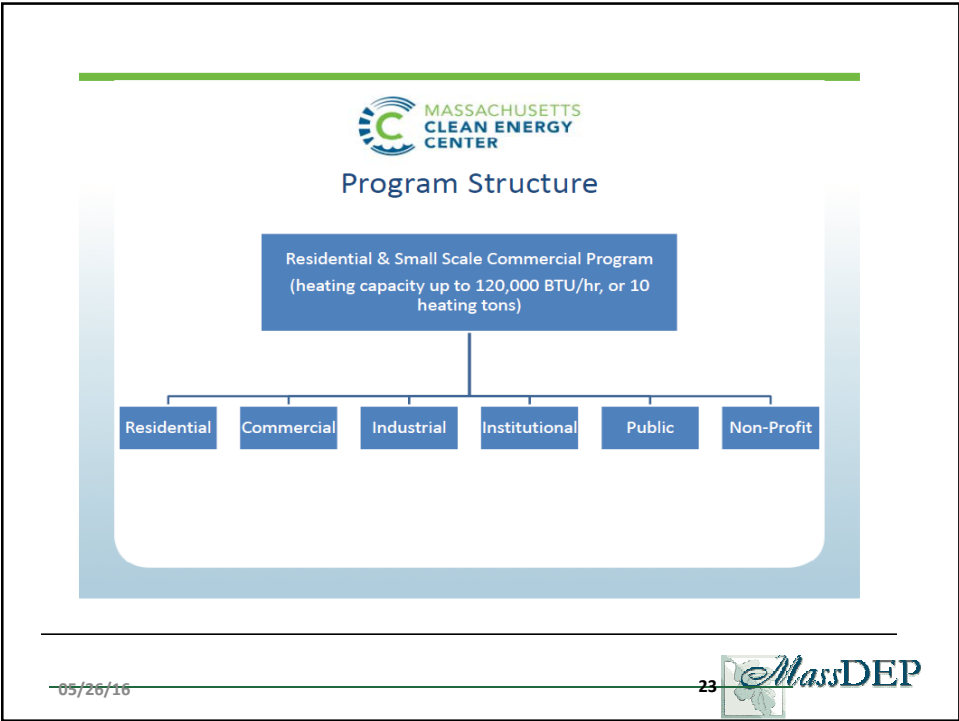
### Resolution

- May 2016 launch of residential/small-scale commercial and commercial programs. For more information, see:
  - [Information for grant applicants](#)
  - [Information for installers](#)

05/26/16

22





## Application Process and Project Timeline

Total Project Time Allowed: 2 years for existing buildings, 3 years for new construction

Phase	Milestone	Time Allowed
1.a.	System Owner selects Designer (and potentially Installer)	
1.b.	System Owner/Designer complete preliminary technical analysis & design, and submits <i>Application</i>	
1.c.	MassCEC reviews <i>Application</i> and reserves <i>Grant</i> funds	2-6 weeks
2.a.	Applicants complete Milestone #1: <i>System Design and Equipment Purchase</i> and submits payment request	Retrofit – 1 yr New Const – 2 yrs
2.b.	MassCEC reviews documentation and issues payment (30% of <i>Grant</i> )	2-4 weeks
3.a.	Applicant completes Milestone #2: <i>Construction and Commissioning</i> and submits payment request	From Award date: Retrofit – 2 yrs New Const – 3 yrs
3.b.	MassCEC reviews documentation and issues payment (70% of <i>Grant</i> )	2-4 weeks



05/26/16

25



## Training & Certifications

### REQUIREMENTS

#### Designer & Installer

One of the following:

- IGSHPA Accredited Installer
- CGD
- PE license with focus in geothermal

#### Additional HVAC Installer

Requirement:

- EPA 608 (usually Type II)

### Recommended Certifications

Contractor Role	Certification
Ground-loop designer (typically the Primary Designer)	<ul style="list-style-type: none"> <li>• CGD</li> <li>• Geology or engineering degree (BS or higher)</li> <li>• Heat pump manufacturer/distributor training</li> <li>• North American Technician Excellence (NATE)</li> </ul>
HVAC system designer	<ul style="list-style-type: none"> <li>• HVAC Excellence</li> <li>• PE license with a focus in mechanical engineering</li> <li>• Heat pump manufacturer/distributor training</li> </ul>
Driller/loop field installer	<ul style="list-style-type: none"> <li>• Massachusetts Well Driller Certification</li> <li>• IGSHPA Accredited Installer</li> </ul>
Heat pump/mechanical installer (typically the Primary Installer)	<ul style="list-style-type: none"> <li>• NATE</li> <li>• HVAC Excellence</li> <li>• PE – Mechanical</li> <li>• Heat pump manufacturer/distributor training</li> <li>• EPA 608 certification</li> <li>• Massachusetts Refrigeration Technician/Contractor</li> </ul>
Distribution system installer	<ul style="list-style-type: none"> <li>• NATE</li> <li>• HVAC Excellence</li> <li>• Massachusetts Refrigeration Technician/Contractor</li> <li>• Plumbing license (hot water pipes)</li> </ul>



05/26/16

26



## What's Next?

- **UPCOMING - GC Workgroup Meeting** – June 7<sup>th</sup>  
– Presentation: Leslie Whitty, MassCEC
- **UNDER DEVELOPMENT - FACT SHEET:** *"RENEWABLE THERMAL TECHNOLOGY APPLICATIONS AT CONTAMINATED PROPERTIES IN MASSACHUSETTS: GROUND-SOURCE HEAT PUMPS"*

05/26/16

27



## Thank You!

**Thomas M. Potter**  
**Clean Energy Development Coordinator**  
 MassDEP Bureau of Waste Site Cleanup  
 One Winter Street, 6<sup>th</sup> Floor  
 Boston, MA 02108  
 617-292-5628  
[Thomas.Potter@state.ma.us](mailto:Thomas.Potter@state.ma.us)

**Clean Energy Results Program Website:**  
<http://www.mass.gov/eea/agencies/massdep/climate-energy/>

05/26/16

28

